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Dairy-Herd-Improvement Letter

ARS-44-161
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RÉSUMÉ OF 1964-65

Genetic Appraisal of Sires

As planned (ARS-44-148), quarterly sire evaluations were made during fiscal year 1965. These genetic appraisals were based on evaluations of 4,826 sires in the Artificial Insemination program and of 13,707 non-AI sires. Collectively, they resulted in 59,963 individual sire records (DHIA Form 1202's) for the cooperating States and were based on 1,685,797 lactation records reported since the last evaluation in 1963-64. A further summary of the quarterly sire evaluations is shown in table 1.

Genetic Appraisal of Cows

The semiannual DHIA Cow Performance Index Lists (ARS-44-154 and ARS-44-160) were issued in January and June 1965, respectively. These indexing procedures are used to evaluate and recognize genetically superior cows. The number of cow evaluations was 13,159 after screening some 550,000 potential qualifiers. Shown below is a summary of minimum milk index levels and number of cows evaluated by breed:

<u>Breed</u>	<u>ARS-44-154</u>		<u>ARS-44-160</u>	
	<u>Minimum level 1/ Milk lb.</u>	<u>Cow eval- uations No.</u>	<u>Minimum level 1/ Milk lb.</u>	<u>Cow eval- uations No.</u>
Ayrshire	1,995	88	1,550	233
Guernsey	1,312	490	1,200	1,175
Holstein	1,711	3,381	1,725	5,893

Jersey	1,189	445	1,175	928
Brown Swiss	1,586	205	1,600	278
Milking Shorthorn	1,350	<u>16</u>	1,350	<u>27</u>
<u>Total</u>		4,625		8,534

1/ Index equated to genetic superiority over herdmates. The average milk index value of all cows was greater than 2,000 pounds.

Cow Production Levels

The 1963-64 production average for cows on Standard DHIA testing was 11,685 pounds of milk and 447 pounds of fat. This was an increase of 399 pounds of milk and 13 pounds of fat per cow over 1962-63. The superiority of DHIA cows over non-DHIA cows increased to 4,349 pounds, 91 pounds more than a year ago. Owner-Sampler cows averaged 10,885 pounds of milk and 404 pounds of fat.

Participation in DHIA Recordkeeping Plans

On January 1, 1965, the combined DHIA recordkeeping program included 67,908 herds and 2,962,557 cows. This is 18.4 percent of the nation's dairy cow population (compared to 17.1 percent in 1964) and is an increase of 244 herds and 140,035 cows over the previous year. Of the total, 40,075 herds and 2,087,581 cows were on the Standard plan; 26,604 herds and 818,406 cows were on the Owner-Sampler plan; and 1,229 herds and 56,570 cows were on the Weigh-a-Day-a-Month plan.

RECENT CHANGES IN METHODS OF GENETIC APPRAISAL

Sire Summaries

Effective in August 1964, a count of the number of herds (up to and including 25) represented among AI progeny, was added to AI sire evaluations. These counts were extended to natural-service evaluations in November 1964.

Commencing in February 1965, a 12-month lag interval between calving date and production run was introduced in order to reduce or eliminate the bias reported in initial or early AI sire summaries (ARS-44-148). This was accomplished by using only lactations with calving dates 364 days prior to the date of the sire evaluation.

In May 1965, the "Predicted Difference" was introduced as the final measure of breeding merit of bulls with AI progeny.

This expression replaces the "Predicted Average" which had been used by USDA since December 1962.

The predicted difference represents the expected deviation of a bull's AI progeny from herdmates in herds producing at levels near breed average, and is currently the most useful method of comparing AI bulls. It is computed as follows:

$$\text{Predicted Diff.} = \frac{\text{No. of daus.}}{\text{No. of daus.} + 12} (\text{Adj. Dau.Av.} - \text{Breed Av.})$$

Cow Indexes

The progeny of both AI and non-AI bulls were included in the two cow indexes (ARS-44-154 and ARS-44-160) computed during the year. Daughters of non-AI bulls were evaluated solely on the basis of their own performance versus herdmates. In the case of AI progeny, both performance of daughters versus herdmates and performance of the sire were included in the index.

The name and address of the herd owner were included in the Cow Performance Index List if the cow was from a herd whose records were machine processed.

3,467 SIRES SUMMARIZED IN MAY 1965

A total of 2,130 non-AI and 1,337 AI sires were evaluated in May 1965. A summary of the 16,748 sire records made available to the cooperating States is shown in table 2.

321,515 COWS SUMMARIZED IN MAY 1965

A total of 32,482 non-AI progeny and 289,033 AI progeny were evaluated in May 1965. Included in the evaluation were 482,118 lactation records received and processed since the previous summary.

1963 BREED-SEASON LACTATION AVERAGES

Breed-season lactation averages for DHIA cows that calved in 1963 are shown in table 3. The average of all available and usable 1,235,935 lactation records, 56 percent of which represent grade cows, was 12,326 pounds of milk and 471 pounds of fat. This represents an increase of 373 pounds of milk and 12 pounds of fat over 1962. The usual and expected seasonal trends were evident.

Shown in table 4 are lactation averages grouped within breed by registered and non-registered categories. By weight-

ing the within-breed milk yield differences between registered and grade cows by the number of records reported in the respective breed, an overall registered breed superiority of 998 pounds of milk and 45 pounds of fat can be obtained. However, it should be recognized that such gross differences that are not within-herd are not necessarily reflective of their producing ability under comparable environments.

TABLE 1.--Sire summaries made in 1964-65

Evaluation	AI		Non-AI		Summaries to States	Records added since previous run
	Sires	Progeny	Sires	Progeny		
	Number	Number	Number	Number	Number	Number
August 1964	1,192	204,343	4,432	59,999	14,727	363,252
November 1964	948	213,472	2,012	18,994	9,583	393,593
February 1965	1,349	364,626	5,133	79,865	18,905	446,834
May 1965	1,337	289,033	2,130	32,482	16,748	482,118
Overall	4,826	1,071,474	13,707	191,340	59,963	1,685,797

TABLE 2.--Number of sire records summarized May 1965, by State and breed

State	Ayrshire	Guernsey	Holstein	Jersey	Brown Swiss	Shorthorn	Red Dane	Other	Total
	Number	Number	Number	Number	Number	Number	Number	Number	Number
Maine-----	23	58	118	48	10	2	--	--	259
New Hampshire-----	30	67	149	40	20	2	--	--	308
Vermont-----	38	67	244	109	33	2	--	--	493
Massachusetts-----	47	99	213	81	44	1	--	--	485
Rhode Island-----	18	36	81	22	--	--	--	--	157
Connecticut-----	38	137	221	68	36	--	--	--	500
New York-----	74	176	554	128	59	5	1	--	997
New Jersey-----	13	122	221	61	44	1	--	--	462
Pennsylvania-----	65	289	574	106	49	7	--	1	1,091
Ohio-----	35	129	299	116	70	3	--	--	652
Indiana-----	17	136	231	63	43	5	--	2	497
Illinois-----	35	133	362	65	72	8	--	--	675
Michigan-----	29	117	416	73	40	8	2	--	685
Wisconsin-----	20	156	547	73	75	9	--	--	880
Minnesota-----	44	102	326	64	48	15	--	--	599
Iowa-----	32	89	325	95	66	13	--	--	620
Missouri-----	--	88	151	71	20	6	--	--	336
North Dakota-----	2	17	63	6	15	3	--	--	106
South Dakota-----	18	12	100	8	16	--	--	--	154
Nebraska-----	4	55	154	24	31	6	--	--	274
Kansas-----	28	47	184	31	30	4	--	--	324
Delaware-----	13	32	102	12	8	--	--	--	167
Maryland-----	32	137	290	44	38	5	--	--	546
Virginia-----	22	129	252	52	28	3	--	--	486
West Virginia-----	15	25	116	26	2	--	--	--	184
North Carolina-----	18	95	197	59	19	--	--	--	388
South Carolina-----	7	95	127	50	19	--	--	--	298
Georgia-----	17	34	140	39	21	--	--	--	251
Florida-----	9	89	60	60	10	--	--	--	228
Kentucky-----	3	38	149	66	19	--	--	--	275
Tennessee-----	18	64	99	81	17	4	--	--	283
Alabama-----	8	43	66	50	8	1	--	--	176
Mississippi-----	15	81	40	52	10	--	--	--	198
Arkansas-----	1	31	49	15	6	3	--	--	105
Louisiana-----	6	47	31	28	4	--	--	--	116
Oklahoma-----	17	33	102	33	10	6	--	--	201
Texas-----	17	72	151	91	27	1	--	--	359
Montana-----	--	10	28	9	8	--	--	--	55
Idaho-----	2	45	126	51	13	2	--	--	239
Wyoming-----	--	3	21	--	5	--	--	--	29
Colorado-----	7	41	116	19	17	--	--	--	200
New Mexico-----	--	39	52	17	--	--	--	--	108
Arizona-----	2	49	65	27	4	--	--	--	147
Utah-----	4	29	133	22	1	--	--	--	189
Nevada-----	--	6	16	26	2	--	--	--	50
Washington-----	13	64	136	57	14	2	--	--	286
Oregon-----	4	61	80	76	15	3	--	--	239
California-----	9	61	213	51	31	--	--	--	365
Puerto Rico-----	--	--	10	--	--	--	--	--	10
Hawaii-----	--	--	5	--	--	--	--	--	5
Alaska-----	--	--	2	--	9	--	--	--	11
Total, individual sire records sent to States-----									16,748
Total sires summarized-----	137	662	1,922	508	187	46	2	3	3,467

TABLE 3.--Breed-season DHIA lactation averages for calvings in 1963

Calving month	Records		Average Production		
	Registered	Total	Milk	Fat	
	Pct.	No.	Lb.	Pct.	Lb.
<u>AYRSHIRE</u>					
January-----	80	2,011	10,651	4.02	428
February-----	80	1,757	10,673	3.99	426
March-----	78	1,980	10,592	3.97	421
April-----	78	1,480	10,534	3.98	419
May-----	78	1,223	10,380	3.98	413
June-----	74	1,204	10,019	3.99	400
July-----	77	2,025	9,971	4.00	399
August-----	79	2,788	9,854	4.06	400
September-----	78	3,024	10,234	4.07	417
October-----	77	2,752	10,682	4.10	438
November-----	77	2,133	10,805	4.05	438
December-----	78	2,094	10,957	4.03	442
Overall-----	78	24,471	10,441	4.03	421
<u>GUERNSEY</u>					
January-----	67	11,220	9,344	4.73	442
February-----	67	9,459	9,341	4.71	440
March-----	67	10,013	9,327	4.69	437
April-----	67	8,162	9,220	4.70	433
May-----	67	7,140	9,110	4.69	427
June-----	66	7,339	8,877	4.70	417
July-----	69	10,145	8,661	4.77	413
August-----	66	13,393	8,565	4.80	411
September-----	64	14,279	8,828	4.84	427
October-----	65	13,563	9,131	4.83	441
November-----	66	11,723	9,366	4.79	449
December-----	66	10,851	9,473	4.73	448
Overall-----	66	127,287	9,090	4.75	432
<u>HOLSTEIN</u>					
January-----	40	76,326	13,314	3.64	484
February-----	38	61,581	13,317	3.62	482
March-----	38	65,050	13,295	3.62	481
April-----	37	51,074	13,206	3.61	477
May-----	36	46,431	13,179	3.60	475
June-----	35	50,544	12,903	3.62	467
July-----	37	77,513	12,670	3.65	462
August-----	37	112,654	12,708	3.66	465
September-----	37	122,718	13,126	3.67	482
October-----	38	112,582	13,452	3.69	496
November-----	39	96,167	13,610	3.67	499
December-----	38	90,919	13,670	3.64	498
Overall-----	38	963,559	13,212	3.65	482
<u>JERSEY</u>					
January-----	63	8,214	8,680	5.09	442
February-----	62	6,806	8,786	5.08	446
March-----	61	6,537	8,719	5.03	439
April-----	61	5,064	8,661	5.02	435
May-----	61	4,532	8,477	5.01	425
June-----	58	4,559	8,247	5.02	414
July-----	60	7,055	7,961	5.09	405
August-----	58	10,300	7,772	5.12	398
September-----	59	10,826	7,972	5.17	412
October-----	60	10,085	8,207	5.17	424
November-----	59	8,500	8,460	5.14	435
December-----	59	8,379	8,585	5.10	438
Overall-----	60	90,857	8,333	5.10	425

TABLE 3.--Breed-season DHIA lactation averages for calvings in 1963 (Con't.)

Calving month	Records		Average Production		
	Registered	Total	Milk	Fat	
	Pct.	No.	Lb.	Pct.	Lb.
BROWN SWISS					
January-----	72	2,261	11,834	4.06	480
February-----	72	1,847	11,762	4.03	474
March-----	72	2,005	11,798	4.02	474
April-----	71	1,770	11,714	4.01	470
May-----	71	1,618	11,612	4.01	466
June-----	71	1,596	11,312	4.06	459
July-----	72	2,181	11,012	4.10	451
August-----	66	2,546	10,943	4.12	451
September-----	66	2,714	11,168	4.14	462
October-----	67	2,592	11,574	4.14	479
November-----	68	2,258	11,931	4.13	493
December-----	68	2,288	12,080	4.06	491
Overall-----	69	25,676	11,547	4.08	471
MILKING SHORTHORN					
January-----	82	343	9,214	3.74	345
February-----	80	281	9,285	3.72	345
March-----	84	359	9,372	3.71	348
April-----	85	249	9,572	3.69	353
May-----	83	213	9,104	3.68	335
June-----	81	175	8,749	3.70	324
July-----	84	303	8,507	3.73	317
August-----	84	393	8,553	3.71	317
September-----	84	390	8,918	3.79	338
October-----	82	398	9,015	3.78	341
November-----	81	299	9,468	3.78	358
December-----	81	310	9,339	3.77	352
Overall-----	83	3,713	9,081	3.74	340
RED DANE					
January-----	--	17	11,363	3.92	445
February-----	--	10	10,995	3.85	423
March-----	--	22	11,559	3.88	448
April-----	--	14	10,235	3.91	400
May-----	--	11	11,529	4.18	482
June-----	--	13	11,161	4.16	464
July-----	--	39	11,594	3.95	458
August-----	--	43	10,727	4.00	429
September-----	--	33	11,172	4.13	461
October-----	--	29	11,673	3.99	466
November-----	--	17	11,390	3.97	452
December-----	--	12	11,617	3.99	464
Overall-----	--	260	11,255	4.00	450
RED POLL					
January-----	80	5	6,394	4.00	256
February-----	57	7	8,180	4.17	341
March-----	46	13	7,706	3.88	299
April-----	50	10	8,079	3.79	306
May-----	86	7	10,010	3.81	381
June-----	33	3	11,153	3.67	409
July-----	25	4	10,295	3.69	380
August-----	63	8	7,373	3.95	291
September-----	100	7	6,913	3.88	268
October-----	87	23	7,491	4.26	319
November-----	90	10	8,054	4.13	333
December-----	73	15	6,831	4.17	285
Overall-----	71	112	7,836	4.01	314
United States--	44	1,235,935	12,326	3.82	471

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TABLE 4.--Breed-season DHIA lactation averages for calvings in 1963, by breed—registered and non-registered

Breed	Registered				Non-registered				All			
	Records	Milk	Fat		Records	Milk	Fat		Records	Milk	Fat	
	No.	Lb.	Pct.	Lb.	No.	Lb.	Pct.	Lb.	No.	Lb.	Pct.	Lb.
Ayrshire-----	19,087	10,595	4.0	428	5,384	9,893	4.0	395	24,471	10,441	4.0	421
Guernsey-----	84,402	9,285	4.8	447	42,885	8,708	4.6	403	127,287	9,090	4.8	432
Holstein-----	363,113	13,917	3.7	511	600,446	12,785	3.6	464	963,559	13,212	3.6	482
Jersey-----	54,477	8,488	5.2	439	36,380	8,100	5.0	403	90,857	8,333	5.1	425
Brown Swiss-----	17,786	11,684	4.1	479	7,890	11,238	4.0	453	25,676	11,547	4.1	471
Milking Shorthorn-	3,069	8,990	3.7	335	644	9,515	3.8	361	3,713	9,081	3.7	340
Red Dane-----	-----	-----	---	---	260	11,255	4.0	450	260	11,255	4.0	450
Red Poll-----	79	7,547	4.0	302	33	8,526	4.0	343	112	7,836	4.0	314
United States-----	542,013	12,431	3.9	489	693,922	12,244	3.7	457	1,235,935	12,326	3.8	471